Montana Fish, Wildlife & Parks

Memo To: Interested Parties

From: Andy Brummond

Date: July 19, 2007

Subject: Summer 2007 Drought Update

General/Statewide

The July 10th version of the U.S. Drought Monitor shows a general declined in conditions over the past six weeks with moderate drought now present in western and north-central areas of Montana. The eastern one half or more of Montana is classified as not experiencing drought. The Monitor can be accessed at http://www.drought.unl.edu/dm/monitor.html. The graphic is prepared using a variety of drought indices, and is updated approximately weekly. The July 5th *U.S. Seasonal Drought Outlook Through September2007* predicts continued drought development in roughly the western half of Montana. (see http://www.cpc.ncep.noaa.gov/products/expert_assessment/seasonal_drought.html).

Updated daily accumulated mountain precipitation and snow water equivalent information can be viewed in tabular form, by basin, and locations within these basins, by accessing: http://www.wcc.nrcs.usda.gov/cgibin/past_up.pl - choose "Montana", enter the month, date, and year, and it will generate the list. Snowmelt is nearly 100% complete and occurred well ahead of normal. The following table contains the current mountain precipitation for the 2007 water year for May 22nd and July 16th. Since May, total mountain precipitation has remained relatively steady to declining slightly. The most notable decline was in the Shoshone basin in Wyoming where mountain precipitation dropped from 88 to 77 percent of normal since May 22nd. Despite near normal mountain precipitation in many basins the lack of snowpack coupled with early runoff has led to well below normal streamflow.

Basin	Total Precipitation (% of avg.), 5/22/06	Total Precipitation (% of avg.), **7/16/2007**
Kootenai	110	**104**
Flathead	99	**94**
Upper Clark Fork	96	**94**
Bitterroot	95	**93**
Lower Clark Fork	97	**88**
Jefferson	87	**85**
Madison	79	**75**
Gallatin	79	**78**
Missouri Headwaters	83	**81**
Hdw. Missouri Mainstem	86	**89**
Smith, Judith, Musselshell	95	**97**
Sun, Teton, Marias	91	**86**
Missouri Mainstem	93	**93**
St. Mary, Milk	109	**106**
Upper Yellowstone	82	**80**
Wind (WY)	81	**76**
Shoshone (WY)	88	**77**
Bighorn (WY)	90	**84**
Tongue (WY)	113	**113**
Powder (WY)	89	**84**
Lower Yellowstone	90	**86**

Review of precipitation for the 12-month period through June 2007 shows all of the state at 90 to 110 percent of average precipitation with the only exception being the Southeastern climate division at 110 to 130 percent of normal. A graphic of this period can be found at http://www.wrcc.dri.edu/cgi-bin/spiFmap.pl?ave12 Over the short-term conditions are not nearly as good. In June, precipitation

was well below average over most of the state with only the Southeastern portion being at average. The North-Central climate division was only 30 to 50 percent of average during June, which normally is the highest precipitation month across Montana. This translates to a significant short-term deficit for that area of the state. See http://www.wrcc.dri.edu/cgi-bin/spiFmap.pl?ave01

Another helpful graphic is located at http://www.cpc.ncep.noaa.gov/cgi-bin/anom_realtime.sh. This graphic is on a national basis, but is updated daily and displays running 30-day (or 90-day) departure from normal precipitation statistics. From the link, choose the bottom-most entry in the column (for most recent date) in either column. The result is four graphics, with "% departure from normal precip" in the lower left.

The Surface Water Supply Index map for July considers soil moisture, precipitation, snow pack, and reservoir storage, according to seasonal relevance. As shown at:
http://nris.state.mt.us/wis/SWSInteractive/SWSI-App.asp?month=7&year=2007
SWSI indices have continued to decline compared to May and June. In May four basins were classified as extremely dry. That number has risen to 13 in July. The SWSI values can be found by clicking on **REPORT** at the bottom center of the map.

Dates of peak flows, by stream, are at http://www.mt.nrcs.usda.gov/snow/watersupply/peakdatetable.html. Peak flows for all Montana rivers have already occurred. Forecasts of low flow timing and amount for selected rivers (Blackfoot, Big Hole, Smith, Dearborn, Jefferson and Gallatin) are posted at http://www.mt.nrcs.usda.gov/snow/watersupply/lowflow.html.

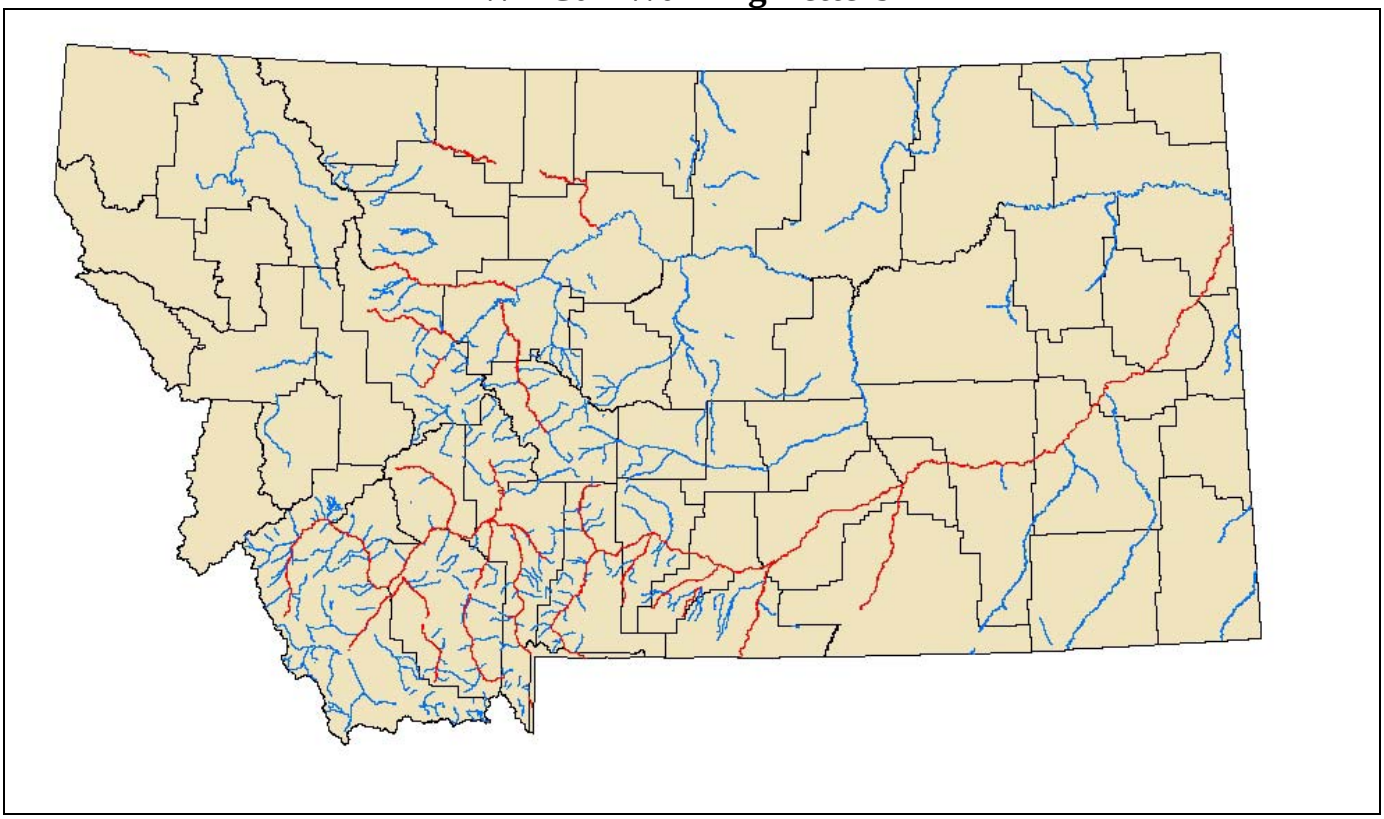
The statewide graphic showing streamflow conditions compared to long-term averages is located at http://mt.waterdata.usgs.gov/nwis/rt. As of July 16th, most rivers that are supported by reservoir releases were showing flows in the 25-74th percentile range while rivers without reservoir storage to supplement flows were generally at the 24th percentile or below. The Teton River near Dutton and the Yellowstone River at Forsyth were at record lows. Data for specific USGS gauges is available at: http://mt.waterdata.usgs.gov/nwis/current?type=flow.

The Montana Drought Monitoring website is located at http://nris.state.mt.us/drought/. Committee members and website administrators welcome suggestions for postings and site organization. Montana's Official Drought Website is at http://drought.mt.gov/

FWP Drought Response

In compliance with the Montana Drought Plan in June FWP sent warning letters to junior water users on several streams and rivers informing them of the likelihood that FWP will be placing a call on them to cease diversions later this summer. Following graphic shows in red the rivers and streams where these letters were sent. The rivers shown in blue also have FWP instream flow water rights, but junior water users did not received call warning letters.

FWP Call Warning Letters



As streamflows have now begun to drop below FWP instream flow levels, call letters will be sent to junior water users asking them to cease diversion until such time streamflow recovers to levels above FWP's instream water rights. This week call letters will be sent to junior water users on the following rivers:

Big Hole River	Beaverhead River
East Gallatin River	Gallatin River
Smith River above Eden Bridge	Marias River
Missouri River between Canyon Ferry and Toston	Bighorn River

Call letters on other rivers, primarily in the Yellowstone River basin will most likely be soon to follow.

FWP in cooperation with USGS is funding 5 additional thermographs to help implement the Drought Fishing Closure Policy. These new water temperature-monitoring sites are on the Yellowstone River at Livingston, Springdale and Big Timber and on the Clark Fork River at Superior and Paradise.

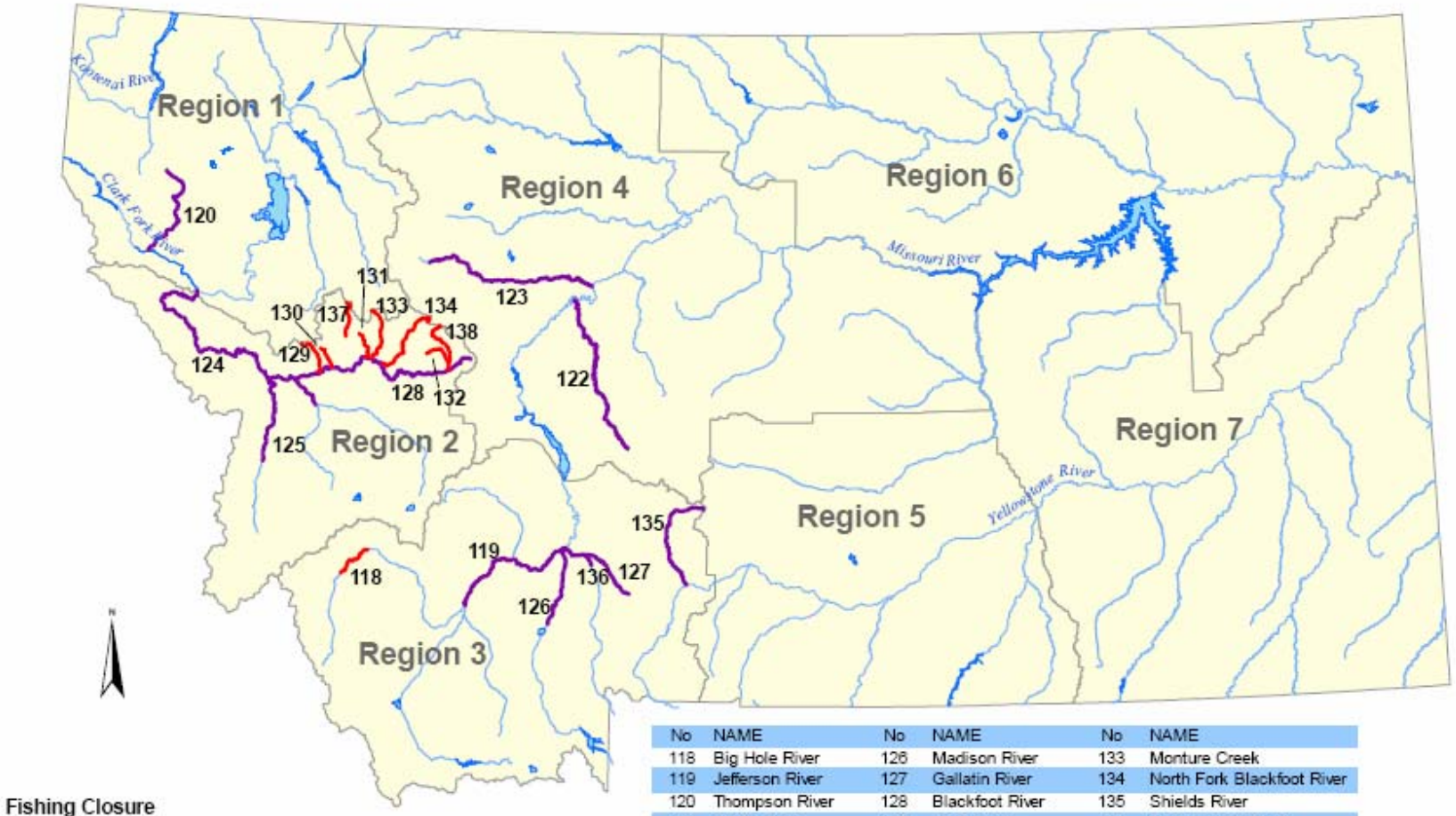
Current fishing closures and restriction information can be found at:
http://fwp.mt.gov/fishing/guide/waterclosure.aspx

The following map shows the fishing restrictions or closures:

Fishing Restrictions and Closures

as of July 19, 2007

Conditions can change rapidly. Be sure to check current drought information.



No	NAME	No	NAME	No	NAME
118	Big Hole River	126	Madison River	133	Monture Creek
119	Jefferson River	127	Gallatin River	134	North Fork Blackfoot River
120	Thompson River	128	Blackfoot River	135	Shields River
122	Smith River	129	Gold Creek	136	East Gallatin River
123	Sun River	130	Belmont Creek	137	Morrell Creek
124	Clark Fork River	131	Cottonwood Creek	138	Landers Fork
125	Bitterroot River	132	Copper Creek		

FWP is continuing to work with watershed groups in areas such as the Jefferson, Blackfoot and Big Hole Rivers where drought plans are being implemented to maintain minimum flows for the fishery. FWP continues to administer existing water leases and pursue new water leases in an effort to maintain and enhance streamflow on key streams throughout Montana.

FWP Regional Reports
Generally the fishery has faired well in the early summer, but conditions have drastically deteriorated across much of the state over the last three weeks.

Temperature related fish kills have been reported in the following rivers:

Noxon Rapids Reservoir – Perch
Middle Big Hole – Trout (likely due to angler release mortality)
Upper Yellowstone – Mountain Whitefish and few long-nose suckers and rainbow trout
Lower Smith - Stonecats

Region 1 – Kalispell
Weather continues very dry and hot with air temperatures hitting the upper 90s and lower 100s with several days with record high temperatures. Streamflows reflect that with flows generally less than half of normal and below 80% exceedance flows. Water temperatures in the Thompson River hit 23 degrees c (73 degrees F) four days in a row and the Thompson was closed to angling from 2 pm to midnight on July 11. Hungry Horse Dam discharge is holding flows in the Flathead River. The Kootenai River is actually above normal flows at 17,000 cfs with discharges for downstream salmon flows and hydropower. Kootenai flows will taper down over summer.

Flathead Lake is essentially full pool. Hungry Horse Reservoir is within 3' of full and Lake Koocanusa is within 6' of full. Ashley Lake topped out within 1' of full, lake levels are starting to drop due to discharge and evaporation. Ashley outflows are reduced to reflect lower predicted inflow.
Lake levels are holding up but surface temperatures are climbing. Rogers Lake is hitting 75 degrees and a grayling kill is ongoing. The Shady Lane Pond is also showing a fish kill of stocked larger cutthroat.

Some perch kills have occurred in Noxon Rapids Reservoir. High temperatures cause some localized conditions in the back of long, narrow bays that cause high temperatures and low dissolved oxygen and a subsequent fish kill. This happens fairly frequently. A blue-green algae bloom in Lake Mary Ronan is anticipated given current conditions as well as a salmon kill in Lake Koocanusa. Both happened last year in similar conditions

Region 2 – Missoula
Painted Rocks (West Fork Bitterroot) Reservoir began releases of 25 cfs to support the Bitterroot fishery on July 16, 2007. An additional 25 cfs is being released to meet irrigation water demands.

Streamflow in the Blackfoot River has dropped to 800 cfs are expected to continue to fall rapidly. The Blackfoot Challenge Drought Committee has already begun implementation the drought plan and has been in contact with outfitters and irrigators.

Region 3 – Bozeman

Big Hole River – The upper reach was closed to angling on July 5th under Big Hole Watershed Committee Drought Plan as flows at USGS Gage at Wisdom declined below 20 cfs on July 1st and 2nd. Efforts to reduce irrigation diversion kept flows above 20 cfs for about 4 days after flow initially declined below 20 on June 26th. Subsequent voluntary irrigation reductions in the Jackson area did not reach the Wisdom Gage. Current conditions have flows hovering between 20 and 25 cfs as irrigators begin to turn off for hay harvest. Flow must average 40cfs or greater for 7 consecutive days to reopen the reach. Water temperatures remaining above 70 degrees for more than 8 hours per day generally peaking in the 76 - 77 degree range with a maximum observed water temperature of 80 degrees.

In the downstream reaches of the Big Hole flows declining rapidly with flows at the USGS Melrose Gage generally about 30% of the Long Term Median for any given date. High-pressure weather systems causing high ambient air temperatures are also resulting in high water temps usually remaining above 70 degrees for 7 to 10 hours per day and peaking out at about 75 degrees. Dead trout, apparently due to angler release mortality, have been observed between Maiden Rock and Melrose. FWP has deployed thermographs at Wisdom, Sportsman's Park, Notch Bottom FAS, and Pennington Bridge in addition to USGS Thermograph at Melrose.

Clark Canyon Reservoir - Beaverhead River - Clark Canyon storage dropping rapidly at about 1,000 - 1,500 acre feet per day. Last month's storage pool about 10,000 acre feet above USBR Projections, however storage levels should decline below 2006 storage conditions by the end of July. Despite Red Rock River flows in excess of long-term median, inflows into Clark Canyon only represent about 30% of average. This is the 3rd consecutive summer under which above average flows in the Red Rock have resulted in far below average inflows into Clark Canyon. It is apparent that water use patterns have changed substantially in the drainage above Clark Canyon.

Beaverhead River flows are at about 850 cfs between Clark Canyon Dam and Barretts Diversion. This is substantially above the long-term median. Despite very high flows in upper river and at the Dillon gauge, flows in the lower river (USGS Gauge at Beaverhead Rock) have hovered between 50 and 90 cfs. The FWP Minimum instream flow for the lower Beaverhead Reach is 200 cfs. These low flows have undoubtedly resulted in extremely high water temperatures in the 75 to 80 degree range. FWP has deployed a thermograph at Beaverhead Rock and will download it during the next high temperature spate.

Spring electrofishing data for the Beaverhead River again showed populations of 18 inch and larger brown trout at record low densities (less than 100 per mile) in the most productive sections of the river. Strong recruitment of Age II brown and rainbow trout should provide recovery in the fishery if minimum flows improve over the next 1 - 3 years. Brown trout and mountain whitefish populations in the lower river remain severely depressed.

Ruby River – When the Ruby River Reservoir stopped spilling water, conservative irrigation releases below Ruby Dam were generally well below the long-term median and reflected extremely low inflows into Ruby Reservoir from the upper river. Currently, reservoir releases are approaching the long-term median as upper river flows are approaching mid summer base flows at about 60% of the long term median. Water temperatures below Warm Spring Creek peaked in the 75 to 76 degree range over the July 4 - July 6 period prompting inquiries about potential angling closure from at least one concerned angler.

As of July 17th flows in the Yellowstone River at Corwin Springs have been well below the long-term median. Since July 1st flows have been below the 95% exceedence level on four separate days. At Livingston flows have also been well below the long-term median. Flows have been below the 95% exceedence level for 14 consecutive days beginning on July 2nd. Maximum daily water temperatures have been as high as 73.2 ° F and have averaged 71 ° F since July 4th. Recently isolated fish kill have been reported from Livingston to as far upstream as Corwin Springs. Most of these have been mountain whitefish, but a small number of longnose suckers and rainbow trout have been reported.

The Shields River has been below the long-term median with water temps as high as 77.4 ° F recently. The forecast is for continued hot temperatures with little chance of precipitation. Irrigation withdrawal is taking place in both drainages and there is continued concerned that there will not be enough water for crops this summer. Without a fair amount of rain and some cooling we may see significant impacts in these basins.

Region 4 – Great Falls

Missouri River below Holter Dam – flows are at about 3,850 cfs and peak water temperature has been up to almost 69F. FWP will monitor the reach for water temperatures and increased use resulting from displacement from other waters.

Little Prickly Pear Cr at Wolf Creek - flows are about 50 cfs, median flows are about 62 cfs, and water temperatures are remaining relatively cool in the lower reaches. Peak water temperature has not exceeded 68F. No plans for time-of-day fishing restrictions.

Dearborn River near Craig – flows are about 70 cfs, median flows are about 152 cfs. Water temperatures warrant time-of-day fishing restrictions.

Smith River below Eagle Creek at the top of the floating section - flow about 80 cfs, time-of day fishing restrictions went into effect on 7/12/07 at 2PM. Peak water temperatures remain high. Flows are below reservations and Murphy rights. Plans are being made to send call letters to junior water right holders.

Smith River near Eden MT - flow is about 165 cfs and have dropped from about 200 cfs on Monday July 9. The time-of day fishing restrictions went into effect on 7/12/07 at 2PM. Peak water temperatures remain high. Flows are nearing water reservations and Murphy rights in this reach, which is 150 cfs. Plans are being made to send call letters to junior water right holders when flows drop below 150 cfs. On the lower parts of the Smith, there have been reports of selective fish kills of stonecats.

Sun River at Simms – flows at Simms have varied from 81-146 cfs during July, which are actually fairly good for this reporting station. The median flow is 96 cfs for July 13. Gibson Reservoir storage is about 50K AF, or 52% of full. Storage will be depleted by early August, and flows near Simms will be reduced to 50 cfs. Water temperatures remain high and time-of day fishing restrictions went into effect on 7/12/07 at 2PM.

Marias River near Loma – flows are 344 cfs, substantially below the instream water reservation of about 488 cfs. Plans are being made to send call letters to junior water right holders. We also plan on discussion a better accounting of contract water released from Lake Elwell when flows released from Tiber Dam decline below 500 cfs.

Region 5 – Billings
Streamflows are dropping fast. As July 16th, the 95% flow at Billings is 4,010 cfs, and current flows are 3,300 cfs and dropping. Regions 3 and 5 are coordinating fishing restrictions and closures for the Yellowstone River. A conference call Wednesday will determine when this week we go to 2PM to Midnight restrictions including a determination of how far upstream on the Yellowstone River they will apply. The new USGS thermographs at Springdale and Big Timber that are making temps much easier to track both for FWP and the public. FWP staff have also put thermographs in the Yellowstone River at Columbus and in the Stillwater and Boulder rivers. These thermographs must be downloaded periodically in order to retrieve the water temperature information.

Most probable projections have the Bighorn River being held at 1,750 cfs through next March. Last month flows were slated to increase to 2,000 cfs by October, but conditions are worsening. Anglers are complaining about excessive sediment in the river, but FWP is more concerned about fall flows than flushing flows. Bighorn Lake's pool level is at 102% of normal.

Region 6 – Glasgow
Flows in the Milk River near the Canadian border have decreased due to lack of recent precipitation and high temperatures. The current flows at the Eastern Crossing are approximately 542 cfs, which is 91% of average flows. The water elevation in Fresno Reservoir has remained stable and relatively high compared to past years due to high spring inflows. The active conservation pool is nearly 88% full. Water levels have been high and stable throughout the spring and continued high reservoir levels will be result in inundated shoreline vegetation and which will benefit the forage and game fishery in Fresno Reservoir.

Early spring and summer precipitation in the Havre area had brought most streams and small reservoirs up to near normal flows and water levels. Further downstream, Nelson Reservoir water elevations remain good with a slight decrease due to irrigation and is currently at 92%. In the eastern portion of Region-Six most small reservoirs and streams also appear to be near normal levels due to spring rains, however there has not been any recent precipitation to maintain these levels.

Flows in the Missouri River peaked around 14,000 cfs in mid-June but have decreased to around 5,520 cfs. Paddlefish will most likely have decreased reproduction and survival of young-of-year fish this year due to the decreased duration and magnitude of flows. Discharge from Ft. Peck Reservoir has averaged near 6,000cfs through June and is scheduled to continue at this flow through July. During June, the reservoir rose 2.3 feet, but with reduced inflows, is forecast to drop 2.1 feet by the end of July. The COE forecasts the reservoir elevation to be at 2201.9 feet msl in late July, which is 32.2 feet below normal pool. The lake level in early July was 1.8 feet below the level it was at this time in 2006.

Current flows (July 13th) in the lower Missouri River near Culbertson are approximately 5,860cfs, which is below the median flow for this time of year of 8,740cfs. Lower flows will reduce natural reproduction of native fish species in the lower Missouri River.

Peak flow in the Milk River occurred at near 5,000cfs on June 20th, which resulted in native fish species in the lower Missouri ascending the river to spawn. Current flow at the Milk River confluence near Nashua is only 43cfs on July 13.

Region 7 – Miles City

Tongue River - The Tongue River system has seen more precipitation in 2007 than has been seen in the past 10 years. Flows in the river have been high and sustained equating to some very interesting responses from the fish community. With the high flows, FWP crews have been able to sample the lower reach of the Tongue River weekly through the spring and summer of 2007. A huge response to the higher flows has been documented in both numbers and species of fish using the Tongue River. Findings of interest include 3 paddlefish, a spent female blue sucker, a channel catfish that had been tagged by FWP crews at Huntley Diversion by Billings, MT only two weeks previous and a multitude of fish in numbers previously unseen.

The fish passage project at the T&Y Diversion was effected by high flooding flows and was damaged by the river overflowing its banks. Roger Muggli of the T&Y Irrigation Company responded to the flooding by doing some emergency berming at the project site during the first days of the flood event and was astounded by the number of fish swimming up the unfinished and flooded passage channel. Once the flooding subsided restoration of the damaged passage channel was started and continues to this date. The passage channel is scheduled to be completed by August 15, 2007.

The recent flood event in the Tongue River indicated a very positive and very strong response by the fish community. Passage at diversions and more so, flows in the system are critical to fish community health.

Precipitation events in July have been limited and ambient temperatures have been very high. These conditions combined with agricultural needs for irrigation waters have resulted in a reduction of volume in the Tongue River in the past two weeks. Overall conditions continue to be very positive.

Tongue River Reservoir - The reservoir at the top end of the Tongue River drainage filled very early in the spring this year and has remained full until currently. Inflows into the reservoir have been high and continue to be above average. These conditions should be very advantageous for fish populations in the reservoir. Surveys in August will determine the immediate impacts of good flow conditions this year.

Prairie Ponds - A wet spring in SE Montana has produced many recharged farm ponds surveys are occurring currently and initial data indicates that over winter survival of many of these ponds was positive. Fish populations in these systems are dependant upon spring recharge, summer maintenance and fall precipitation events to carry the ponds through to the next year.

Cc (electronic):

FWP Director, Commission Members
T. Palmer, D. Tipton – FWP, ConEd (for distribution to regional Information Officers)
FWP Regional Supervisors – Kalispell, Missoula, Bozeman, Great Falls, Billings, Glasgow, Miles City
Helena Fisheries Division staff
FWP Fish Managers and "Drought Biologists"
Governor's Drought Committee Staff and Website (http://nris.state.mt.us/drought/)